

REMARKS/ARGUMENTS

The Status of the Claims.

Claims 26 to 37, 40 to 42, 44 to 48 and 60 to 63 are pending with entry of this amendment. Claims 1 to 25, 38, 39, 43 and 49 to 59 being previously cancelled; claim 46 is cancelled herein. Claims 61 and 62 are added herein. Claim 26 is amended herein. The amendments introduce no new matter and support is replete throughout the specification. These amendments are made without prejudice and are not to be construed as abandonment of the previously claimed subject matter or agreement with any objection or rejection of record.

With respect to amended claim 26 and new claim 61, support for can be found throughout the specification. The amendment merely removes a limitation from the independent claim and reestablishes the same limitation in the new dependent claim.

With regard to new claim 62, this is the original claim 46 moved to follow the claim upon which it depends.

Applicants submit that no new matter has been added to the application by way of the above Amendment. Accordingly, entry of the Amendment is respectfully requested.

35 U.S.C. §103(a).

Claims 26 to 37, 40 to 42, 44 to 48, 60 and 61 were rejected under 35 U.S.C. §103(a) as allegedly obvious based on Bruchez (U.S. 6,274,323) variously in light of Mahamuni (J. Applied Physics, 85: 2861-2865), Cao (Angew. Chem. Int. Ed. 38 (24): 3692-3694 (1999)), Weiss (WO00/55631) and Bruchez (Science 281: 2013-2016 (1998)). To the extent the rejection is deemed applicable to the amended claims, Applicants traverse.

As a preliminary matter, Applicants note that this case has gone on for some time with multiple new non-final Office Actions having various rejections based on references that do not teach mixed populations of nanocrystals. After the fourth Office Action, Applicants appealed obviousness rejections based on Bruchez '323, Cao, Weiss, and Bruchez Science. In a Request for Review, Applicants won a Decision that found the

rejections improper based on arguments presented that the cited references do not teach mixed populations of nanocrystals. Now, the present Action again rejected the unamended claims based on Bruchez '323, Cao, Weiss, and Bruchez Science; with the addition on of only Mahamuni. Mahamuni teaches separate populations of nanocrystals, as does the Bruchez '323 primary reference, as well as others. Logic alone requires that the current rejections must be considered improper without further explanation, which is not provided in the present action. Because the previous rejections were found improper, the new reference does not teach mixed populations of nanocrystals, and the Office does not even identify facts teaching this key claim aspect, the rejections must be withdrawn.

A proper analysis under the recently reaffirmed *Graham v John Deere* standard demonstrates the non-obviousness of the invention. According to the Supreme Court in *KSR International Co v. Teleflex* (550 U.S. ____ (2007); 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385-1396 (US 2007)), the appropriate standard for analyzing questions of obviousness is that:

the scope and content of the prior art are determined, differences between the prior art and the claims at issue are analyzed and the level of ordinary skill in the pertinent art is resolved. Against this background the obviousness or non-obviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unresolved needs, failure of others, etc. might be utilized to give light to the circumstances surrounding the origin of the subject matter to be patented.

Id. quoting *Graham v. John Deere of Kansas City* 383 U.S. 1, 17-18.

The current Examination Guidelines (e.g., MPEP 2143) and *KSR* require the Office in an obviousness rejection to provide a statement as to why one of skill would have combined known elements. Further, an obviousness rejection must include fact-based findings demonstrating: 1) a combination of reference elements describing each limitation of the claims, 2) known elements that function in the same way in the combination as in the references themselves, 3) the elements are combined by known methods, 4) the result of the suggested combination of elements would have been predictable, and 5) one of skill in the art would have expected success in providing the claim in light of the references. Here, the rejection fails each of these requirements, as applied to the *Graham* factors.

Claims are not obvious based on the combination of Bruchez '323 and Mahamuni.

Claims 26 to 29, 31, 32, 34, 35, 37, 40, 46 to 48, 60 and 61 were rejected based on the combination of Bruchez '323 and Mahamuni.

The independent claim 26 is as follows:

A composition, comprising:

a population of nanocrystals characterized by an excitation spectrum and an emission spectrum, wherein the emission spectrum and at least a portion of the excitation spectrum are in the nonvisible range;

wherein the population of nanocrystals comprises a mixture of two or more subsets of nanocrystals, the subsets characterized by different excitation wavelengths, and

wherein the emissions of the population comprise different wavelengths or different wavelength intensities when alternately excited with the different excitation wavelengths.

Not all limitations are taught. The Action at page 5 alleges "Bruchez et al. also disclose nanocrystal mixtures in column 8, lines 45-50." The following is the citation:

"As used in this specification and the appended claims, the singular forms 'a,' 'an' and 'the' include plural references unless the content clearly dictates otherwise. Thus, for example, reference to 'a semiconductor nanocrystal' includes a mixture of two or more such semiconductor nanocrystals, an "analyte" includes more than one such analyte, and the like."

Applicants note that the allegation and citation are not even directed to the subject matter of the claim, e.g., a population of two or more nanocrystal subsets with different spectra. Such an allegation can not support the present rejection.

An analyte in Bruchez includes two or more molecules of the analyte, and discussion of a nanocrystal includes mixtures of two or more of the same (such) nanocrystal. This is irrelevant to the rejected claims. The title sentence of the paragraph sets the context as "plural references" to singular forms, which even laymen understand means more than one of the singular item, not mixtures of different items. Applicants note, this paragraph is standard patent application boilerplate commonly inserted into applications to avoid the linguistic trap wherein discussion of "a" composition component is interpreted to exclude the concept of two or more of the same component from the scope of the claims or from the recognized disclosure. For example, an inventor would not want his assay method claims limited to detection of assay samples containing only one molecule of the analyte of interest. In the context of the cited paragraph concerning singular and plural expressions, one of skill

in the art would know Bruchez was establishing that the phrase "a semiconductor nanocrystal" teaches and supports claims to two or more of the nanocrystal. There is no allusion in the citation to mixtures of different nanocrystals, only an inclusion of more than one such nanocrystal where the reference singularly refers to a nanocrystal.

As discussed in several prior Responses to the same argument, the plural of a nanocrystal does not teach "a population of nanocrystals compris[ing] a mixture of two or more subsets of nanocrystals". At page 10 of the present Action, a mixture is found "because a mixture of [such] semiconductor nanocrystals encompasses different species of nanocrystals." Applicants do not take Official Notice of this conclusory statement and request a fact-based analysis in support, as is required by MPEP 2144.03. Indeed, as the citation expressly states: "a" nanocrystal "includes plural references" to "a mixture of two or more such nanocrystals". Webster's: such - of the character indicated (not of a character different from the character indicated). The mixture literally suggested in the cited standard singular/plural boilerplate is a mixture of two or more of the same such nanocrystals; without any suggestion of different nanocrystals. Applicants stand by the more extensive remarks showing Bruchez does not teach a mixed population of nanocrystals presented in previous Request for Preappeal Review and Responses, e.g., starting at page 7 of the June 26, 2008 Response. For example, preparation of separate nanocrystal populations at column 19 of Bruchez (reiterated in the Action at page 7) does not teach a mixed population; nor do the separate species of exemplary nanocrystal materials at column 17 (as reiterated in the Action at page 10).

Mahamuni is offered as illustrating "the alternating excitation of ZnO quantum dots using excitation wavelengths of 300 nm and 325 nm, respectively" in Figures 5 and 6. This adds nothing to the previously discredited rejections, which argued, e.g., that Cao provided different [separate] populations of nanocrystals excited at different wavelengths (see Action of July 24, 2007, at page 5). This argument has been discredited in the Decision of the Request for Preappeal Review. The combination of Bruchez '323 and a reference such as Mahamuni teaching separate nanocrystals excited separately at different wavelengths does not render the claims obvious. Exciting separately does not teach exciting a mixed population. Further, even if one were to mix the different nanocrystals (which is not

suggested by any reference) into a population, the resultant emissions on excitation would not be simply the sum of the separated emissions, e.g., because of differences caused by capture (and possible reemission) of energy between different subsets in a mixed population. Therefore, Mahamuni does not teach the emissions of a mixed nanocrystal population in response to alternate excitation wavelengths.

So, the claims are not obvious at least because the combination of references does not teach all limitations of the claims. The Action acknowledges at page 5 that "Bruchez does not teach that emissions of the population comprise different wavelengths ... when alternately excited with different excitation wavelengths." Emphasis added. Again, it is noted that the population referred to is a population of nanocrystals comprising two or more subsets of nanocrystals, which is also a limitation not found in Bruchez '323. Further, Bruchez '323 does not teach the population of nanocrystals characterized by an excitation spectrum and an emission spectrum. Mahamuni does not cure these defects and the Action does not allege as much.

The suggested combination does not use known elements that function in the same way in the combination as in the references themselves. The separate nanocrystals of Mahamuni are shown to function by providing particular emission spectra in response to each of two excitation wavelengths. However, when combined with Bruchez '323 as suggested, they would not function the same, and would not actually provide the invention, as claimed. As a preliminary matter, the different nanocrystals of Mahamuni would not be combined for use according to known methods because the methods are not known, nor are they even alleged in the Action. Assuming it were known in cited art (and it is not) to mix nanocrystal populations to provide a composite emission, even then a mixture of the separate nanocrystals would not function in the same way in the mixture as they do separately, as discussed above. For example, the absorption and emissions output functions of the different nanocrystals would not be the same in the theoretical mixture as in separate populations of Mahamuni. That is, the interactions between the different nanocrystals constitute a different function and would result in a different ultimate emission output compared to the separate nanocrystals taught in Mahamuni. Therefore, according to MPEP 2143 the combination can not be considered obvious.

The result of the suggested combination would not be predictable. The combination of Bruchez '323 and Mahamuni would not be expected to succeed in providing the present claims, at least because not all limitations are taught. Further, one of skill could not predict the emissions output of a mixed population of different nanocrystal subsets, e.g., based on the separate pure population emissions.

Because not all limitations are taught, the suggested elements would function differently than in the reference, without an expectation of success, the claims can not be considered obvious based on the cited references. With regard to dependent claims, because they include all limitations of the parent, they can not be considered obvious. Further, as noted in past Responses with regard to claims 47 and 48, the animals can not be considered barriers because they are never described in Bruchez as in contact with any nanocrystal, but only as antibody sources. Applicants respectfully request withdrawal of the rejections.

Claims are not obvious based on the combination of Bruchez '323, Mahamuni, and Cao. Claims 33, 36, 41 and 42 were rejected based on the combination of Bruchez '323, Mahamuni and Cao. Applicants note that Cao is cumulative to the other art, teaching separate populations of nanocrystals. Cao does not cure the defect in the rejection failing to teach, e.g., a population of nanocrystals comprising two or more subsets, or providing a mixed nanocrystal population comprising different emissions when alternately excited by different wavelengths. Because Cao does not cure the defect in the rejection of the independent claim, the dependent claims can not be considered obvious.

Claims are not obvious based on the combination of Bruchez '323, Mahamuni, and Weiss. Claims 44 and 45 were rejected based on the combination of Bruchez '323, Mahamuni and Weiss. Applicants note that Weiss does not cure the defect in the rejection failing to teach, e.g., a population of nanocrystals comprising two or more subsets, or providing a mixed nanocrystal population comprising different emissions when alternately excited by different wavelengths. Because Weiss does not cure the defect in the rejection of the independent claim, dependent claims 44 and 45 can not be considered obvious.

Claims are not obvious based on the combination of Bruchez '323, Mahamuni, and Bruchez Science. Claim 30 were rejected based on the combination of Bruchez '323,

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Mahamuni and Bruchez Science. Bruchez Science does not cure the defect in the parent claim rejection failing to teach, e.g., a population of nanocrystals comprising two or more subsets, or providing a mixed nanocrystal population comprising different emissions when alternately excited by different wavelengths. Because Bruchez Science does not cure the defect in the rejection of the independent claim, dependent claim 30 can not be considered obvious.

CONCLUSION

In view of the foregoing, Applicants believes all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the claims are deemed not to be in condition for allowance after consideration of this Response, a telephone interview with the Examiner is hereby requested. Please telephone the undersigned at (510) 769-3510 to schedule an interview.

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Attachments:

- 1) A transmittal sheet; and,
- 2) A receipt indication postcard.